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DOCUMENT-IDENTIFIER: US 6383928 B1

TITLE: Post copper CMP clean

Abstract Text (1):

A non-contact post CMP clean-up process. A corrosion inhibitor is used to protect the copper (118) surface to prevent an electrochemical reaction between the p-well and n-well areas. A multi-step wet chemistry is used to clean all exposed surfaces without etching more than 100 .ANG. of the dielectric (110), copper (118), or liner (116). The first step uses a basic solution and a surfactant (124). The second step uses a diluted HF solution (126) and the third step uses an organic acid solution (128).

Brief Summary Text (8):

The invention is a non-contact post CMP clean-up process. A corrosion inhibitor is used to protect the copper surface to prevent an electrochemical reaction between the p-well and n-well areas while polishing. A multi-step wet chemistry is used to clean all exposed surfaces without etching more than 100 .ANG. of the copper, liner, or dielectric. The wet clean chemistry is a batch process that allows high throughput and is cost effective.

Detailed Description Text (10):

The first step uses a basic solution and a surfactant, 124, as shown in FIG. 2E. If desired, an optional rinse with megasonic may be performed prior to introducing these chemicals. The basic solution may comprise NH_{sub}.4 OH or TMAH (tetramethylammonium hydroxide) at less than 0.1% wt. The surfactant may be on the order of 0.1% (e.g., 0.5 to 2%) surfactant. This step is used to remove slurry particles. The mixture of basic solution and surfactant may be used for a duration in the range of 3-5 minutes with megasonic. Both the surfactant and the corrosion inhibitor help protect the copper surface from NH_{sub}.3 attack. As discussed above, the corrosion inhibitor forms a compound 120 on the copper surface that prevents or slows the NH_{sub}.3 etching. A quick-dump-rise (QDR) is then performed.

CLAIMS:

6. The method of claim 1, wherein said basic solution comprises TMAH.
18. The method of claim 13, wherein said basic solution comprises TMAH.